

2.3 continuity

def.
p 79

$f(x)$ is continuous at
 $x=c$ if $\lim_{x \rightarrow c} f(x) = f(c)$

limit value = function value

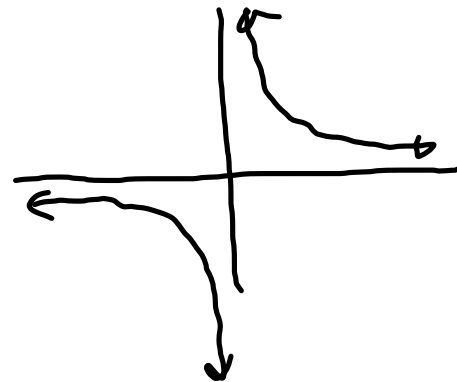
ex $\frac{\sin x}{x}$ is not continuous at $x=0$

because : $\lim_{x \rightarrow 0} \frac{\sin x}{x} = 1$ $f(0) = \neq$

$f(x) = \frac{1}{x}$ is discontinuous
at $x = 0$

$$\lim_{x \rightarrow 0} f(x) = \infty$$

~~x~~
dne



is $f(x) = \frac{1}{x}$ continuous at $x=1$?

yes prove: ① $\lim_{x \rightarrow 1} \frac{1}{x} = 1$

② $f(1) = 1$

③ equal

continuity on an interval
is $y = \frac{1}{x}$ cont. on $(-1, 1)$?

no

is $y = \frac{1}{x}$ cont on
 $(-\infty, 0) \cup (0, \infty)$

yes

piecewise ex.

$$f(x) = \begin{cases} \frac{x^2 - 4}{x - 2} & \text{if } x \neq 2 \\ k & \text{if } x = 2 \end{cases}$$

what should k equal to
make $f(x)$ continuous at
 $x = 2$?

$$\frac{x^2-4}{x-2} = \frac{(x+2)(x-2)}{x-2} = x+2$$

